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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/689,776	10/20/2003	William D. Fisher	10981523-5	4544

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AGILENT TECHNOLOGIES, INC.
Intellectual Property Administration
Legal Department, DL429
P.O. Box 7599
Loveland, CO 80537-0599

EXAMINER

GORDON, BRIAN R

ART UNIT	PAPER NUMBER
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1797

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/689,776	Applicant(s) FISHER ET AL.	
	Examiner Brian R. Gordon	Art Unit 1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 March 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-30 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on March 10, 2008 has been entered.

2. Applicant's arguments filed February 8, 2008 have been fully considered but they are not persuasive. The rejection of the method claims as based upon Bjornson et al. is hereby withdrawn for failing to disclose the contacting step. However as to claim 29, the rejection is maintained.

Bjornson et al. discloses transfer element 622 is employed to transfer for force liquid from the aperture in the same manner as the disclosed deformable cantilevered beam tip that displaces liquid as taught at column 10, lines 16-32.

Madden is silent to the device being deformable. The term deformable is interpreted mean the device is elastic, bendable, flexible. Madden discloses the plates are manufactured from somewhat elastic materials that include acrylics, polycarbonates, polypropylenes and polysulfones (column 12, lines 6-7).

The only requirement of the claims is that the device be deformable. The degree of deformability is not at issue. As previously stated the entire device is made of an elastic material as such it is inherent that the entire device is somewhat deformable.

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As to claim 30, applicant asserts the drip plate 16 is not an element of the well. The examiner disagrees. Applicant has not defined or given any special meaning to the term "well". Applicant has not provided any specified definition to what structure constitutes a well or what structure is excluded from comprising a well. There is nothing precluding one from considering the combination of elements including the drip plate as defining the wells of Madden et al. If applicant's device did not incorporate the deformable wall that is a different material from the vertical walls, liquid would simply pass through. As such, would the device without the deformable wall be considered as comprising wells, eventhough the device would not be capable of retaining liquid. If the same argument were applicable to applicant's invention the deformable wall would not be considered an element of the well for it is a distinct material from that of the portions of the device.

For reasons given herein above, the previous rejections are maintained as given herein.

It should be noted applicant's method is employs the conventionally known technique of "touch off" dispensing. The technique involves the creation of a pendant/hanging drop (inherent swollen convex meniscus) on a dispensing device and bring the drop in physical contact with the desired dispensing location. (see for example US Patents 6,551,557; 5,457,167; 5,143,849; and 4,041,995).

Claim Rejections - 35 USC § 102

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3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

4. Claim 29 is rejected under 35 U.S.C. 102(e) as being anticipated by Bjornson et al. US 6,284,113.

Bjornson et al. disclose once device 100 is attached to multiwell plate 54, the resulting apparatus 50 is inverted so that each of the apertures 30 fills with liquid. A meniscus 60 is formed at opening 34. Apparatus 50 is, for example, then positioned adjacent to an array of sample receiving reservoirs 142, which are part of microfluidic networks 108 in a microfluidic network plate 110 as depicted in FIG. 5. Each of the microfluidic networks 108 has an electrode 64 connected to an electrode 62 attached to transfer element 22. An electric potential is applied to the electroconductive material means of electrodes 62 and 64 causing a precise amount of liquid 58 in each of transfer elements 22 to be forced out of the transfer elements and into a corresponding sample receiving reservoir 142.

In the case of typical piezoelectric activation, picoliter to nanoliter droplets can be delivered at 1 kHz frequencies by cycling the deformation of a piezoelectric material via voltage modulation. Recent advances in high-frequency printing mechanisms have made it possible to deliver such droplets at 50 kHz frequencies by using a piezoelectric element to vibrate a microfabricated cantilevered beam with a tip that is in fluid communication with a liquid reservoir.

In another embodiment, as shown in FIG. 19, the present invention may be employed in conjunction with capillary size dispensing tubes 804 associated with the apertures 703 of the present devices. The capillary tubes are used to

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form small drops of fluid and locate them precisely on substrate surfaces 142 in miniature arrays. The printed arrays may consist of nucleic acids, peptides, immunoassay reagents, pharmaceutical test compounds and the like. As shown in FIG. 20, the array 900 of capillary dispensing tubes in fluid communication with the array of source wells may be used to locate the drops on a substrate in predetermined patterns. Nanoliter quantities of liquids may be dispensed. Arrays of biological samples as dense as approximately sixteen hundred per square centimeter with center to center spacing as small as about two hundred fifty micrometers may be formed (column 24, line 27+).

As to claims 29, it should be noted the portion of claim directed to the water is considered intended use for the water is not considered an element of the device. The portion directed thereto describes a desired use or intended use with water wherein the device is not excluded from being employed with any other fluid.

5. Claim 29-30 are rejected under 35 U.S.C. 102(e) as being anticipated by Madden et al. US 6,783,732.

Madden et al. disclose a multiwell arrangement and in one embodiment, the vacuum pathways pass through the plane of the collection-tray upper surface by way of vents that traverse the collection tray proximate each of said collection wells (column 6, line 35+). Also in this embodiment, the gas -permeable matrix covers the vents. The device includes openings 26.

Claim Rejections - 35 USC § 103

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6. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

7. Claim is 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bjornson et al. as applied to claims 1-5, 10-14, 16-27 and 29 above, and further in view of Madden et al.

Bjornson et al. do not disclose employing a permeable membrane.

Madden et al. disclose a multiwell arrangement and in one embodiment, the vacuum pathways pass through the plane of the collection-tray upper surface by way of vents that traverse the collection tray proximate each of said collection wells (column 6, line 35+). Also in this embodiment, the gas -permeable matrix covers the vents.

It would have been obvious to one ordinary skill in the art to recognize that the device of Bjornson et al. maybe alternatively modified to incorporated the pneumatic device as taught by Madden et al. as an alternate means of transferring the liquid from the respective chambers.

8. Claims 1-14 and 17-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hasskamp US 4,537,231 in view of Madden et al. (or any other reference that teaches touch off dispensing).

Hasskamp discloses an apparatus for simultaneously dispensing like volumes of liquid to an array of wells is shown in FIGS. 1 and 2. The apparatus includes a standard 20, supported by a base 22, releasably carrying a horizontally extending dispenser module 24 having an apertured top surface with dependent walls 26 each forming a dispenser chamber 28 (well) in alignment

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with a corresponding well. Clamped in sealed relationship across the module top surface is a diaphragm 29 (deformable wall); a horizontal plate 30 having a downwardly extending arrangement of plungers 31 overlies the module, each plunger being in registration with a corresponding dispenser chamber and each being exactly the same size. Plate 30 is manually movable toward and away from the dispenser module by means a rack and pinion drive. Operation of the drive causes the plungers to deflect downwardly diaphragm portions, to reduce the volume of each dispenser chamber by an equal amount as shown in FIG. 2. After the lower or nozzle ends of walls 26 are inserted in a pan of liquid beneath the liquid level, retraction of the plunger plate permits the diaphragm, due to its resiliency, to return to its FIG. 1 position, thus drawing an equal volume of the liquid into each dispenser chamber. Replacement of the pan with the tray and operation of the drive effects release of the liquid from the dispenser chambers into the wells. (column 1, lines 25-50).

Hasskamp does not specify touch off dispensing occurs when dispensing to wells.

Madden et al. discloses provides multi-well plates and column arrays in which samples (e.g., cell lysates containing nucleic acids of interest, such as RNA) can be analyzed and/or processed. The reference also disclose a touch-off operation whereby a plurality of drip directors is laterally shifted to the right and to the left such that the drip director outlet regions simultaneously abut inner sidewalls of a plurality of corresponding collection wells. (column 10, lines 31-36).

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It would have been obvious to one of ordinary skill in the art at the time of the invention would recognize the device of Hasskamp may be employed to practice the well known touch off dispensing method as taught by Madden et al.

Hasskamp does not disclose employing a permeable membrane.

Madden et al. disclose a multiwell arrangement and in one embodiment, the vacuum pathways pass through the plane of the collection-tray upper surface by way of vents that traverse the collection tray proximate each of said collection wells (column 6, line 35+). Also in this embodiment, the gas -permeable matrix covers the vents.

It would have been obvious to one ordinary skill in the art to recognize that the device of Hasskamp maybe alternatively modified to incorporated the pneumatic device as taught by Madden et al. as an alternate means of transferring the liquid from the respective chambers.

9. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over HassKamp in view of Madden et al. as applied to claims 1-5, 10-14, 17-27 and 29 above, and further in view of Church hill et al.

Hasskamp in view of Madden et al.. do not disclose employing a heat dispensing actuator.

Churchill et al. disclose those skilled in the art will recognize that other types of dispensers and valve actuation devices exist and may be used with efficacy. These may include, for example, but are not limited to piezoelectric dispensers, fluid impulse dispensers, heat actuated dispensers, air brush dispensers, and the like.

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As such it would have been obvious to one ordinary skill in the art to recognize that the modified device of Hasskamp maybe alternatively modified to incorporate the heat actuators as taught by Churchill et al.

10. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over HassKamp in view of Madden et al. as applied to claims 1-14, and 17-29 and 29 above, and further in view of Bjornson et al..

Hasskamp in view of Madden et al.. do not disclose employing a piezoelectric actuator.

Bjornson et al. disclose dispensing device that employs piezoelectric activation so that picoliter to nanoliter droplets can be delivered at 1 kHz frequencies by cycling the deformation of a piezoelectric material via voltage modulation.

As such it would have been obvious to one ordinary skill in the art to recognize that the modified device of HassKamp maybe alternatively modified to incorporate the piezoelectric actuators as taught by Bjornson et al.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Ershov; Gennady Moiseevich et al.; Schurenberg, Martin et al.; Wolk, Jeffrey A. et al.; Little, Daniel P. et al.; O'Keefe; Matthew et al.; Kolar; Pramod et al.; Borrelli; Nicholas F. et al.; Garyantes; Tina; Velghe; Franck et al.; and Bochkariov; Dmitry disclose dispensing devices.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian R. Gordon whose telephone number is 571-272-1258. The examiner can normally be reached on M-F, 1st Fri. Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill Warden can be reached on 571-272-1267. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Brian R Gordon/
Primary Examiner
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